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MEMORANDUM TO THE DEPUTY MINISTER

CANADIAN OIL SANDS SUPPLY COSTS AND
DEVELOPMENT PROJECTS (2011-2045)

(Information by May 18, 2012)

SUMMARY

- This note summarizes the Canadian Energy Research Institute (CERI) report entitled "Canadian Oil Sands Supply Costs and Development Projects (2011-2045)" (the Report).
- The Report outlines supply costs for hypothetical new oil sands projects. Costs are defined as the constant dollar price for oil sands projects required in order to cover project costs and provide a 10-percent internal rate of return. Under the CERI's *Reference Case Scenario*, supply costs are estimated at \$64.62 per barrel for in situ steam-assisted gravity drainage (SAGD), \$81.51 per barrel for stand-alone mining, and \$91.07 for integrated mining and upgrading.
- Although the CERI forecasts oil sands production and capacity levels to grow, periods of rapid growth have and will continue to provide result in challenges for the Alberta economy. The CERI's results, along with findings in other recent industry analyses, suggest that increases in capital and operating costs could call into question industry projections for growth in the longer term.

BACKGROUND

In March 2012, the CERI released its seventh edition of the Report. The Report examines the current cost structure for the oil sands industry and projects costs over the next 35 years.

Supply costs are estimated for hypothetical, new oil sands projects, and are defined by the CERI as the constant dollar price needed to recover all capital expenditures, operating costs, royalties and taxes, and earn a specified return on investment. A 10-percent real annual rate of return is specified (12.5 percent nominally, assuming an annual inflation rate of 2.5 percent) over a 30-year project operating life.

Supply Costs

The Report calculates the WTI-equivalent¹ supply cost under the *Reference Case Scenario* for the production of bitumen using three methods (for a breakdown of costs, see Attachment 1):

1. SAGD, with a supply cost of \$64.62² per barrel;
2. Surface mining, with a supply cost of \$81.51 per barrel; and
3. Integrated mining and upgrading operations, with a supply cost of \$91.07 per barrel.

In 2011, both the Energy Resources Conservation Board (ERCB) and the National Energy Board (NEB) published reports containing supply costs. The ERCB estimated supply costs of \$47–57 per barrel for SAGD, \$63–81 per barrel for mining, and \$88–102 per barrel for integrated mining and upgrading. For the NEB, supply costs for the same technologies were \$50–60 per barrel, \$65–75 per barrel, and \$85–95 per barrel. With respect to SAGD projects, the CERI estimates supply costs to be between seven and 13 percent higher than the ERCB and the NEB. The discrepancy in SAGD costs is a result of differing forecast assumptions for natural gas input intensity and price.

Total Production

Under the CERI's *Reference Case Scenario*, oil sands production rose from 1.5 million barrels per day (MMB/D) in 2010 to 5.4 MMB/D in 2045. The Canadian Association of Petroleum Producers (CAPP), the NEB, and the ERCB have also released production estimates, with all estimates up to 2020 being similar. Only the CERI and the NEB provide longer-term estimates, with both arriving at similar production estimates for 2035; however, the CERI assumes a higher growth rate from 2020 to 2030, before levelling off and converging with the NEB's forecast (see Attachment 2). The CERI maintains its production forecast is achievable within the constraints of Alberta's labour and capital markets, and is in line with expected pipeline capacity additions.

Greenhouse Gas Emissions

The Report also projects greenhouse gas (GHG) emissions from current and future oil sands projects to 2045, calculated using the CERI's emissions factor assumptions. Under the *Reference Case Scenario*, whereby provincial emission reduction strategies are harmonized with a broader North American policy, GHG emissions are projected to rise from 45 megatons of carbon dioxide equivalent per year in 2010 to 159 megatons per year in 2045. A note has been prepared under a separate cover (N12-131365) to compare the CERI's projections with those of Environment Canada and Natural Resources Canada's (NRCan) own assessment.

¹ The WTI equivalent supply cost accounts for the cost of blending and transporting bitumen to market in Cushing, Oklahoma.

It is worth noting, however, that only technologies that were either in the pilot or commercial phase at the time of the study were included in the emission factor calculations. Therefore, the impact of further technological innovations in reducing GHG emissions is not included in the CERI's projections, nor is this something that is easily modelled/forecast.

CONSIDERATIONS

CERI has lowered its supply cost estimates compared to last year's report, primarily due to a lower natural gas price forecast. Natural gas prices are becoming increasingly important, as most new projects use SAGD technology, for which the single highest operating cost is the cost of natural gas. The Report uses a natural gas price of \$4.42 per million British Thermal Units; however, the price is currently \$1.98; as a result, the cost savings compared to last year are likely also understated.

As noted above, GHG emissions are projected to rise significantly over the next 30-years. CERI projects that the cost of complying with GHG regulations will increase from \$747 million in 2011 to just over \$12 billion (B) in 2045, with industry paying approximately \$200B in compliance costs over this time period. However, these costs only account for an estimated one percent of supply costs and are therefore only expected to moderately temper growth.

The oil sands industry has experienced substantial capital cost overruns in the past due to rising capital and operating costs, and it is possible that rapid expansion, anticipated new environmental regulations and other factors could again push costs higher. The CERI notes that their projected period of more rapid growth in oil sands development (2018 to 2034) could introduce challenges to the Alberta economy similar to those faced during the 2004 to 2008 period. The *Low Case Scenario* partially explores such an outcome, with lower levels of economic growth and higher costs resulting in project start-up delays, reducing production forecasts to 4.6 MMB/D from 5.4 MMB/D (in the *Reference Case Scenario*) in 2045.

² All values in real 2010 Canadian dollars, unless otherwise stated.

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NEXT STEPS

NRCan will continue to monitor the cost structure of the oil sands industry and brief you on issues as they emerge.



Mark Corey

Attachments: (2)

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